

REMARKS/ARGUMENTS

Claims 1-25 remain pending. By this Amendment, claims 1, 7, 16, 17 and 19 are amended.

The drawings were objected-to under 37 C.F.R. § 1.83(a), on the basis that the assignment of elements and the permissible relationships of the modules, as set forth in independent claims 1, 17 and 19, needed to be shown. Reconsideration and withdrawal of this objection is respectfully requested.

It is respectfully submitted that the drawings, taken together with the tables set forth in the specification, clearly illustrate the claimed features. An exemplary assignment of elements to modules, and the relationships of those modules, is illustrated in Figs. 3a and 3b. In particular, Fig. 3a shows a modular parent harness 7 including a door control unit 8, a mirror control unit 9, a basic radio unit 10 and an advanced radio unit 11. Fig. 3b shows how, with a system in accordance with the invention, the design of the parent harness is broken down into four modules 13, 14, 15 and 16. Permissible relationships of these modules are shown in Table 1, at page 10 of the specification. So, for example, since an automobile will include a basic radio unit or an advanced radio unit but not both, these two modules are indicated to be incompatible with each other. As a further illustrated permissible relationship, each of the mirror, radio 1 and radio 2 modules are shown to be compulsory with door control unit module 8. Exemplary assignments of wires to modules are illustrated in Table 2, at page 11 of the specification.

The specification was objected-to for attempting to incorporate essential material by reference to a publication. This objection is respectfully traversed. The references to the CAPITAL H system available from Mentor Graphics Corporation, at pages 11 and 33, are not attempts to incorporate a publication by reference. Rather, these are simply references to a software product commercially available at the time the present application was filed. Moreover, the details of the CAPITAL H product are not necessary to permit one skilled in the art to understand and practice the claimed inventions, and those details are not relied on to provide support for the claims under 35 U.S.C. § 112, first paragraph. The claims are fully supported by the descriptions provided within the four corners of the application, as explained further below.

Claims 1-25 were rejected under 35 U.S.C. § 112, first paragraph. The Office Action alleges that “there is no actual description of how the assignment of elements is accomplished, what the permissible relationships are, or how they relate to the various modules sufficient to allow one skilled in the art to make and/or use the invention.” This rejection is respectfully traversed.

As explained above in connection with the drawing objections, the application provides a clear simplified example of a modular parent harness design, how that design may be broken down into modules (assignment of elements to modules) and the permissible relationships of the modules. Those skilled in the art will understand that the assignment process, and the determination of permissible relationships, will be carried out based upon the particular details of any given harness design scenario. For example, as described from page 12 through page 14, a user will enter modular parent harness base details, assign individual modules to a corresponding modular parent harness and define a compatibility list.

The application describes in detail algorithmic approaches and rules for carrying out the assignation process. For example, at page 12, lines 8-10, it is described that modules may be assigned to components based on “modules that were pre-assigned to the wires within the item.” This pre-assignment of wires may be carried out manually. The assignation of node components and insulation is described at page 16, lines 8-27. Rules for assigning modules to connectors and extra node components, where the main component is a connector, are set forth at page 17, line 23 through page 19, line 5. Rules for assigning modules to splices, ultrasonic welds and solder sleeve are described at page 19, lines 22-28. Rules for assigning modules to cavity components and extra cavity components are set forth at page 20, line 4 - page 21, line 13. Rules for assigning modules to branch insulation are set forth at page 21, line 14 - page 22, line 26.

The present invention enables a modular approach to wiring harness design which represents a significant departure from the “composite harness” approach previously used (and included in the Mentor Graphics’ CAPITAL H system available from Mentor Graphics Corporation referenced in the specification). The “composite harness” approach is described in the Background of the Invention section of the present application at page 2, line 26 - page 3,

line 18. As will be understood from that description, in the composite harness approach, a manufacturer would specify a number of harnesses representing derivative or variants on a composite harness, corresponding to option choices available to a consumer. However, due to practical limitations on the number of variants that can be engineered, costed, built and inventoried, the number of derivatives for any composite harness design has necessarily been finite, usually no greater than 30. As a result, e.g., the harnesses available do not exactly match the requirements dictated by a consumer's option selections. To assure that all option possibilities can be met, it is necessary with the "composite" approach to include in the derivative harnesses so-called "give aways," i.e., harness wires and components corresponding to non-selected options. This increases costs.

In contrast to the composite harness approach, the modular approach facilitated by the claimed systems arranges the wire and component element requirements of a product offering into modules from which a harness design may be built-up to precisely meet a set of option selections, thus avoiding the cost of give-aways. The present invention can be used to make such a modular approach manageable, e.g., from a harness design, costing and parts inventory standpoint.

In particular, the invention deals with a practical impediment to the adoption of a modular approach to harness design, namely how to define discrete modules when harness wire and component elements do not fit neatly within a single feature category that may be defined as a module, but rather apply to plural feature categories. To deal with this dilemma, and as recited in each of independent claims 1, 17 and 19, each wire and component element is assigned to be part of at least one module, data representing at least some of the elements is associated with a plurality of modules, and an element which has data associated with a plurality of modules that may be used together is assigned to be part of only one of that plurality of modules but has data associated with each of that plurality of modules. In this manner, the interrelationships of the defined modules can be understood (by virtue of the association of the data representing at least some of the elements with a plurality of modules) while the modules are appropriately configured to have the element in question included in only one of the modules. This permits

proper module interconnectivity, and appropriate costing, etc., based on inclusion of the element in only one of the modules.

Claims 1-25 were rejected under 35 U.S.C. § 102(b) as being clearly anticipated by Ishikawa et al. U.S. Patent No. 6,457,165. This rejection is respectfully traversed.

Ishikawa et al. disclose a computer aided design (CAD) tool used in the design of a wiring harness, wherein route information which is input is linked to wiring information derived from stored data for plural "auxiliary units." See the Abstract. The "auxiliary units" may be terminals and connectors (see col. 1, lines 29-30) as well as components to be connected to a wiring harness such as an ABS, and a lamp and an electronic control unit (ECU). See col. 6, lines 42-49.

Ishikawa et al. do not describe a modular approach as claimed, wherein each element is assigned to be part of at least one module, data representing at least some of the elements is associated with a plurality of modules, and an element which has data associated with a plurality of modules that may be used together is assigned to be part of only one of that plurality of modules but has data associated with each of that plurality of modules. Ishikawa et al. do not address the practical impediment to adoption of a modular approach which is addressed by the present invention -- the handling of wire and component element requirements that apply to plural feature sets rather than a single feature set. Accordingly, reconsideration and withdrawal of the rejection is respectfully requested.

Claims 1-25 were also rejected under 35 U.S.C. § 102(b) as being clearly anticipated by the article "Wiring Harness Design, Can a Computer Help?" by Billsdon et al. This rejection is respectfully traversed.

The Billsdon et al. article, which describes a computer-aided wiring harness design system, also does not teach or suggest the claimed inventions, which address a practical impediment to adoption of a modular harness design approach. In particular, Billsdon et al. describe a system for designing a harness in the first instance, without regard to how to deal with necessary variations on a basic (composite or parent) design arising by virtue of specification of different option combinations and the like. The Billsdon et al. article is devoid of any teaching or suggestion of the recited features of a harness element being assigned to be part of at least one

Appln. No.: 09/771,115
Amendment dated November 9, 2004
Reply to Office Action of June 21, 2004

module, data representing at least some of the elements being associated with a plurality of modules, and an element which has data associated with a plurality of modules that may be used together being assigned to be part of only one of that plurality of modules but having data associated with each of that plurality of modules. Accordingly, reconsideration and withdrawal of this rejection is respectfully requested.

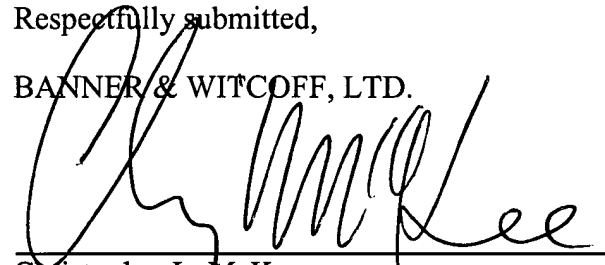
For all of the foregoing reasons, it is respectfully submitted that this application is now in condition for allowance. If the Examiner believes that anything further is desirable in order to place the application in even better form for allowance, he is respectfully urged to telephone applicant's undersigned representative at the below-listed telephone number.

Respectfully submitted,

BANNER & WITCOFF, LTD.

Dated: November 9, 2004

By:


Christopher L. McKee
Registration No. 32,384

1001 G Street, N.W.
Washington, D.C. 20001-4597
Tel: (202) 824-3000
Fax: (202) 824-3001
CLM:lab:bls